What is claimed is:

1. A compound having the formula:

$$R_{10}$$
 R_{10}
 R_{11}
 R

wherein R_1 and R_4 is H, a C_1 to C_4 alkyl group, or an acyl group;

wherein R_2 is an ether, ester, amide, aromatic group, a phthalimide group, a substituted phthalimide group or is covalently bound to R_6 ;

wherein R_3 is =0, OH, an ether group, an acyl group, or a sulfide group;

wherein R_5 is H, halogen, OH, $-OC_{(2-6)}$ alkyl group, an ether group, an acyl group, or an amide group;

wherein R_6 is =0, OH, OCH $_3$, CN, an acyloxy group or is covalently bound to R_2 ;

wherein R_7 , is H, =O, OH, OCH $_3$, halogen, an ether group, or an acyl group;

wherein R_8 and R_9 are independently H, CH_3 , OCH_3 , OC_2H_5 , Br, F, CF_3 , or R_8 and R_9 are joined together as a methylenedioxy group, or other five or six membered ring;

wherein R_{10} and R_{11} are independently CH_3 , OCH_3 , OC_2H_5 , SCH_3 ,

or SC₂H₅;

wherein R_{12} is $H\mbox{, a }C_1$ to C_4 alkyl group, or an acyl group; and

wherein the chiral center marked \ast has the R or the S configuration.

2. The compound of claim 1, having the formula:

$$R_4$$
 R_5 R_8 R_9 R_8 R_8 R_9 R_8 R_8 R_9 R_8

wherein $R_1,\ R_2,\ R_3,\ R_4,\ R_5,\ R_6,\ R_7,\ R_8,$ and R_9 are defined as in claim 1.

3. The compound of claim 2, having the formula:

$$R_4$$
O R_4 O R_5 R_6 R_7 R_8

wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , and R_7 are defined as in claim 1.

- 4. The compound of claim 3, wherein R_1 is CH_3 , R_3 is =0, R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 5. The compound of claim 4, wherein R_2 is OC(0)H.
- 6. The compound of claim 4, wherein R_2 is H.
- 7. The compound of claim 4, wherein R_2 is OH.
- 8. The compound of claim 4, wherein R_2 is -O-benzene.
- 9. The compound of claim 4, wherein R_2 is OCOCH₃.
- 10. The compound of claim 4, wherein R_2 is -0-t- butyldimethylsilyl.
- 11. The compound of claim 4, wherein R_2 is -O-Pivaloyl.

- 12. The compound of claim 3, wherein R_1 is H, R_3 is =0, R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 13. The compound of claim 12, wherein R_2 is -O-pivaloyl.
- 14. The compound of claim 3, wherein R_1 is H, R_3 is =0, R_4 is benzene₃, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 15. The compound of claim 3, wherein R_1 is H, R_3 is =0, R_4 is H, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 16. The compound of claim 3, wherein R_1 is H, R_3 is =0, R_4 is H, R_5 is H, R_6 is =0, and R_7 is H.
- 17. The compound of claim 3, wherein R_3 is =0, R_4 is H, R_5 is halogen, R_6 is =0, and R_7 is H.

18. The compound of claim 2, having the formula:

$$\begin{array}{c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

wherein $R_{1},\ R_{2},\ R_{3},\ R_{4},\ R_{5},\ R_{6},$ and R_{7} are defined as in claim 1.

- 19. The compound of claim 18, wherein R_1 is CH_3 , R_3 is =0, R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 20. The compound of claim 19, wherein R_2 is OC(O)H.
- 21. The compound of claim 19, wherein R_2 is H.
- 22. The compound of claim 19, wherein R_2 is OH.
- 23. The compound of claim 19, wherein R_2 is -O-benzene.
- 24. The compound of claim 19, wherein R_2 is OCOCH₃.
- 25. The compound of claim 19, wherein R_2 is -0-t- butyldimethylsilyl.
- 26. The compound of claim 19, wherein R_2 is -O-Pivaloyl.

- 27. The compound of claim 18, wherein R_1 is H, R_3 is =0, R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 28. The compound of claim 27, wherein R_2 is -0-pivaloyl.
- 29. The compound of claim 18, wherein R_1 is H, R_3 is =0, R_4 is benzene₃, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 30. The compound of claim 18, wherein R_1 is H, R_3 is =0, R_4 is H, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 31. The compound of claim 18, wherein R_1 is H, R_3 is =0, R_4 is H, R_5 is H, R_6 is =0, and R_7 is H.
- 32. The compound of claim 18, wherein R_1 is H, R_3 is =0, R_4 is H, R_5 is halogen, R_6 is =0, and R_7 is H.

33. A compound having the formula:

$$R_{40}$$
 R_{11}
 R_{10}
 R_{11}
 R_{11}
 R_{10}
 R_{11}
 R

wherein R_1 and R_4 is H, a C_1 to C_4 alkyl group, or an acyl group; wherein R_2 is an ether, ester, amide, an aromatic ring, a phthalimide group, a substituted phthalimide group or is covalently bound to R_6 ;

wherein R_{5} is H, halogen, OH, an ether group, an acyl group, or an amide group;

wherein R_6 is =0, OH, OCH $_3$, CN, or an acyloxy group or is covalently bound to R_2 ;

wherein R_7 , is =0, OH, halogen, an ether group, or an acyl group;

wherein R_8 and R_9 are independently H, CH_3 , OCH_3 , OC_2H_5 , Br, F, CF_3 , or R_8 and R_9 are joined together as a methylenedioxy group, or other five or six membered ring;

wherein R_{10} and R_{11} are independently $CH_3,\ OCH_3,\ OC_2H_5,\ SCH_3,$ or $SC_2H_5;$

wherein R_{12} is H, a C_1 to C_4 alkyl group, or an acyl group.

34. The compound of claim 33, having the formula:

$$\begin{array}{c} \text{OMe} \\ \\ \text{R}_{4}\text{O} \\ \\ \text{NMe} \\ \\ \text{R}_{8} \\ \\ \\ \text{R}_{9} \\ \\ \\ \text{R}_{2} \\ \end{array}$$

wherein $R_{1}\text{, }R_{2}\text{, }R_{4}\text{, }R_{5}\text{, }R_{6}\text{, }R_{7}\text{, }R_{8}\text{ and }R_{9}\text{ are defined as in claim 33.}$

- 43. The compound of claim 36, wherein R_2 is -O-Pivaloyl.
- 44. The compound of claim 35, wherein R_1 is H, R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 45. The compound of claim 44, wherein R_2 is -O-pivaloyl.
- 46. The compound of claim 35, wherein R_1 is H, R_4 is benzene₃, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 47. The compound of claim 35, wherein R_1 is H, R_4 is H, R_5 is OCH₃, R_6 is =O, and R_7 is H.
- 48. The compound of claim 35, wherein R_1 is H, R_4 is H, R_5 is H, R_6 is =0, and R_7 is H.
- 49. The compound of claim 35, wherein R_1 is H, R_4 is H, R_5 is halogen, R_6 is =0, and R_7 is H.

35. The compound of claim 34, having the formula:

$$\begin{array}{c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

wherein R_1 , R_2 , R_4 , R_5 , R_6 , and R_7 are defined as in claim 33.

- 36. The compound of claim 35, wherein R_1 is CH_3 , R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 37. The compound of claim 36, wherein R_2 is OC(0)H.
- 38. The compound of claim 36, wherein R_2 is H.
- 39. The compound of claim 36, wherein R_2 is OH.
- 40. The compound of claim 36, wherein R_2 is -O-benzene.
- 41. The compound of claim 36, wherein R_2 is OCOCH₃.
- 42. The compound of claim 36, wherein R_2 is -0-t-butyldimethylsilyl.

50. The compound of claim 34, having the formula:

$$\begin{array}{c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

wherein R_1 , R_2 , R_4 , R_5 , R_6 , and R_7 are defined as in claim 33.

- 51. The compound of claim 50, wherein R_1 is CH_3 , R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 52. The compound of claim 51, wherein R_2 is OC(O)H.
- 53. The compound of claim 51, wherein R_2 is H.
- 54. The compound of claim 51, wherein R_2 is OH.
- 55. The compound of claim 51, wherein R_2 is -O-benzene.
- 56. The compound of claim 51, wherein R_2 is OCOCH₃.
- 57. The compound of claim 51, wherein R_2 is -0-t- butyldimethylsilyl.
- 58. The compound of claim 51, wherein R_2 is -O-Pivaloyl.

- 59. The compound of claim 50, wherein R_1 is H, R_4 is CH_3 , R_5 is OCH_3 , R_6 is =0, and R_7 is H.
- 60. The compound of claim 59, wherein R_2 is -O-pivaloyl.
- 61. The compound of claim 50, wherein R_1 is H, R_4 is benzene₃, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 62. The compound of claim 50, wherein R_1 is H, R_4 is H, R_5 is OCH₃, R_6 is =0, and R_7 is H.
- 63. The compound of claim 50, wherein R_1 is H, R_4 is H, R_5 is H, R_6 is =0, and R_7 is H.
- 64. The compound of claim 50, wherein R_1 is H, R_4 is H, R_5 is halogen, R_6 is =0, and R_7 is H.

65. A compound having the formula:

wherein R_4 is H, a C_1 to C_4 alkyl group, or an acyl group;

wherein R_5 is H, halogen, OH, an ether group, an acyl group, a sulfide group or an amide group;

wherein R_{11} is CH_3 , OCH_3 , OC_2H_5 , SCH_3 , or SC_2H_5 ; and wherein R_{12} is H, a C_1 to C_4 alkyl group, or an acyl group.

66. A compound having the formula:

wherein R_1 is H, a C_1 to C_4 alkyl group, or an acyl group;

wherein R_3 is =0, OH, an ether group, an acyl group, a sulfide group or an amide group;

wherein R_8 and R_9 are independently H, CH_3 , OCH_3 , OC_2H_5 , SCH_5 , SC_2H_5 , or R_8 and R_9 are joined together to form a five or six membered ring;

wherein R_{10} is CH_3 , OCH_3 , OC_2H_5 , SCH_3 , or SC_2H_5 .

67. A method of producing the compound of claim 1, comprising reacting a compound having the formula A as follows

with a compound having the formula B as follows

wherein R_1 and R_4 is H, a C_1 to C_4 alkyl group, or an acyl group; wherein R_3 is =0, OH, an ether group, an acyl group, a sulfide group or an amide group;

wherein $R_{\scriptscriptstyle 5}$ is H, halogen, OH, an ether group, an acyl group, a sulfide group or an amide group;

wherein R_8 and R_9 are independently H, CH_3 , OC_2H_3 , OC_2H_3 , SCH_3 , SC_2H_5 , or R_8 and R_9 are joined together to form a five or six membered ring;

wherein R_{10} and R_{11} are independently $CH_3,\ OCH_3,\ OC_2H_5,\ SCH_3,$ or $SC_2H_5;$ and

wherein R_{12} is H, a C_1 to C_4 alkyl group, or an acyl group, so as to produce the compound of claim 1.

- 68. The method of claim 67, wherein the reaction is performed in the presence of N, N-bis(2-oxo-3-oxazolidinyl)phosphinic chloride.
- 69. The method of claim 67, wherein the reaction is performed in the presence of Dess-Martin periodinate.
- 70. The method of claim 69, wherein the reaction is further performed in the presence of CH_2Cl_2 .
- 71. A method of producing the compound of claim 33, comprising reacting the compound of claim 1 with camphor sulfonic acid (CSA) in the presence of toluene.
- 72. A pharmaceutical composition for treating a tumor in a subject, comprising a pharmaceutically effective amount of the compound of claim 1 or 33 and a pharmaceutically acceptable carrier.
- 73. A method of inhibiting proliferation of tumor cells which comprises contacting the cells under suitable conditions with an effective amount of the compound of claim 1 or 33.
- 74. A method of treating a patient having a tumor characterized by proliferation of neoplastic cells which comprises administering to the patient an effective amount of the compound of claim 1 or 33.
- 75. The method of claim 74, wherein the effective amount is from about 0.5 mg to about 5 mg per day.
- 76. The method of claim 75, wherein the effective amount is from about 1 mg to about 3 mg per day.
- 77. The method of claim 76, wherein the effective amount is about 2 mg per day.

78. The compound of claim 65, having the formula:

wherein R_4 and R_5 are defined as in claim 65.

- 79. A compound as in claim 78, wherein R_4 is CH_3 and R_5 is CH_3 (compound 1).
- 80. A compound as in claim 78, wherein R_4 is Bn and R_5 is H (compound $\bf 3$).
- 81. The compound of claim 66 having the formula:

82. The compound of claim 66, having the formula:

wherein R_1 , R_3 , and R_{10} , are defined as in claim 66.

83. The compound of claim 82, having the formula:

84. A compound having the formula:

$$R_{10}$$
 R_{10}
 R_{10}
 R_{11}
 R

wherein R_1 and R_4 is H, a C_1 to C_4 alkyl group, or an acyl group;

wherein R_2 is an ether, ester, amide, aromatic group or is covalently bound to $R_6;$

wherein R_3 is =0, OH, H, an ether group, an acyl group, or a sulfide group;

wherein R_5 is H, halogen, OH, $-OC_{(2-6)}$ alkyl group, an ether group, an acyl group, or an amide group;

wherein R_6 is =0, OH, OCH₃, CN, or an acyloxy group or is covalently bound to R_2 ;

wherein R_7 , is H, =O, OH, OCH $_3$, halogen, an ether group, or an acyl group;

wherein R_8 and R_9 are independently H, CH_3 , OCH_3 , OC_2H_5 , Br, F, CF_3 , or R_8 and R_9 are joined together as a methylenedioxy group, or other five or six membered ring;

wherein R_{10} and R_{11} are independently CH_3 , OCH_3 , OC_2H_5 , SCH_3 , or SC_2H_5 ;

wherein R_{12} is H, a C_1 to C_4 alkyl group, or an acyl group; and

wherein the chiral center marked \ast has the R or the S configuration.

85. The compound of claim 84, having the formula:

$$\begin{array}{c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

wherein $R_1,\ R_2,\ R_3,\ R_4,\ R_5,\ R_6,\ R_7,\ R_8,$ and R_9 are defined as in claim 84.

86. The compound of claim 85, having the formula:

$$\begin{array}{c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , and R_7 are defined as in claim 84.

- 87. The compound of claim 86, wherein R_1 is H, R_2 is OH, R_3 is H, R_4 is H, R_5 is H, R_6 is =0, and R_7 is H (Compound 113).
- 88. The compound of claim 86, wherein R_3 is H, R_4 is CH_3 , R_5 is OCH_3 , and R_7 is H.
- 89. The compound of claim 88, wherein R_2 is OH.
- 90. The compound of claim 89, wherein R_6 is H and R_1 is CH_3 (Compound 107).
- 91. The compound of claim 89, wherein R_6 is =0 and R_1 is H (Compound 104).
- 92. The compound of claim 88, wherein R_2 and R_6 are joined as an ester bond.
- 93. The compound of claim 92, wherein R_1 is H (Compound 105).
- 94. The compound of claim 92, wherein R_1 is CH_3 (Compound 106).

95. The compound of claim 84, having the formula:

$$\begin{array}{c} & & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & & \\ & \\ & & \\ &$$

wherein R_1 , R_2 , R_3 , R_4 , R_5 , R_6 , and R_7 are defined as in claim 84.

- 96. The compound of claim 95, wherein R_1 is H, R_2 is OH, R_6 is =0, and R_7 is H.
- 97. The compound of claim 96, wherein R_4 is CH_3 , R_5 is OCH_3 .
- 98. The compound of claim 97, wherein R_3 is OH (Compound 109).
- 99. The compound of claim 97, wherein R_3 is H (Compound 111).
- 100. The compound of claim 96, wherein R_3 is H, R_4 is H and R_5 is H (Compound 112).
- 101. The compound of claim 95, wherein R_1 is H, R_2 is OH, R_3 is =0, R_4 is CH₃, R_5 is OCH₃, R_6 is =0, and R_7 is H. (Compound 108).

- 102. The compound of claim 50, wherein R_1 is H, R_2 is OH, R_4 is CH_3 , R_5 is CH_3 , R_6 is =0, and R_7 is H (Compound **110**).
- 103. The method of claim 67, wherein the compound having formula B is:

$$R_{10}$$
 OR_1
 R_3
 NH
 OBn

104. A method of producing the compound of claim 84, comprising reacting a compound having the formula A as follows:

with a compound having the formula C as follows:

wherein R_1 and R_4 is H, a C_1 to C_4 alkyl group, or an acyl group; wherein R_3 is =0, OH, an ether group, an acyl group, a sulfide group, an amide group H;

wherein R_5 is H, halogen, OH, an ether group, an acyl group, a sulfide group or an amide group;

wherein R_8 and R_9 are independently H, CH_3 , OC_2H_3 , OC_2H_3 , SCH_3 , SC_2H_5 , or R_8 and R_9 are joined together to form a five or six membered ring;

wherein R_{10} and R_{11} are independently $CH_3,\ OCH_3,\ OC_2H_5,\ SCH_3,$ or $SC_2H_5;$ and

wherein R_{12} is H, a C_1 to C_4 alkyl group, or an acyl group, so as to produce the compound of claim 84.

105. The method of claim 104, wherein the compound having the formula C is:

$$R_{10}$$
 OR_1
 R_3
 NH
 OBn

- 106. The method of claim 104, wherein the reaction is performed in the presence of N, N-bis(2-oxo-3-oxazolidinyl)phosphinic chloride.
- 107. The method of claim 104, wherein the reaction is performed in the presence of Dess-Martin periodinate.
- 108. The method of claim 107, wherein the reaction is further performed in the presence of CH_2Cl_2 .
- 109. The method of claim 104, wherein the reaction is performed in the presence of H_2 , 10%Pd/C, Ethanol-ascetic acid and hydrochloric acid.
- 110. A method of producing the compound of claim 1, comprising reacting the compound of claim 33 with H_2 , 10%Pd/C, Ethanol-ascetic acid in the presence of hydrochloric acid.

- 111. The compound of claim 33, wherein R_2 is an ether, ester, amide, an aromatic ring or is covalently bound to R_6 .
- 112. A method of preparing the compound in claim 1, comprising reacting the compound in claim 111 with H_2 , 10%Pd/C, Ethanol-ascetic acid in the presence of hydrochloric acid.
- 113. The compound of claim 50, wherein R_2 is an ether, ester, amide, an aromatic ring or is covalently bound to R_6 .
- 114. A method of preparing the compound in claim 18, comprising reacting the compound in claim 113 with H_2 , 10%Pd/C, Ethanol-ascetic acid in the presence of hydrochloric acid.
- 115. A pharmaceutical composition for treating a tumor in a subject, comprising a pharmaceutically effective amount of the compound of claim 84 or 95 and a pharmaceutically acceptable carrier.
- 116. A method of inhibiting proliferation of tumor cells which comprises contacting the cells under suitable conditions with an effective amount of the compound of claim 84 or 95.
- 117. A method of treating a patient having a tumor characterized by proliferation of neoplastic cells which comprises administering to the patient an effective amount of the compound of claim 84 or 95.
- 118. The method of claim 117, wherein the effective amount is from about 0.5 mg to about 5 mg per day.
- 119. The method of claim 118, wherein the effective amount is from about 1 mg to about 3 mg per day.

120. The method of claim 119, wherein the effective amount is about 2 mg per day.